भारतीय मानक
Indian Standard

IS 1151 : 2021

रिफाइंड चीनी — विशिष्टि

(तीसरा पुनरीक्षण)

Refined Sugar — Specification

(*Third Revision*)

ICS 67.180.10

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भारतीय मानक ब्यूरो
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March 2021 **Price Group 4**

Sugar Industry Sectional Committee, FAD 02

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Sugar Industry Sectional Committee had been approved by the Food and Agriculture Divisional Council.

Refined sugar is manufactured from any type of sugar or sugar cane or sugar beet, in general by a process of purification, consisting broadly of affination, melting, chemical treatment, filtration, decolourization and subsequent recrystallization in vacuum pan, the treatment depending upon the nature of the initial material. It may be of any grain size (large, medium or small).

This standard was published in 1958 and first revised in 1969 to incorporate the international recommendations in respect of requirements and methods of tests for colour and specific conductivity of refined sugar. The second revision was being undertaken to align with the revised Codex Standard for Sugars, CODEX STAN 212-1999 and to align the methods of test with the International Commission for Uniform Methods of Sugar Analysis.

In this revision, the value of polarization increase, colour in ICUMSA units changed and the limit of Sulphur dioxide reduced. Further, additional requirements, such as sediment, limit of iron and floc test incorporated in this revision of refined sugar standard.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and the Rules framed thereunder and the Legal Metrology (Packaged Commodities) Rules, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is given at Annex E.

For the purpose of deciding whether a requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

REFINED SUGAR — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for refined sugar.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
498 : 2018	Grading for vacuum pan (plantation white and refined) sugar (*sixth revision*)
1152 : 2003	Icing sugar — Specification (*second revision*)
1943: 1995	Textiles — A twill jute bags — Specification (*second revision*)
4905: 2015/ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
10146 : 1982	Specification for polyethylene for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.
10910 : 1984	Specification for polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
14350 : 1996	Code for hygienic conditions in sugar factories
14968 : 2015	Textiles — High density polyethylene (HDPE)/ polypropylene (PP) woven sacks for packing – 50 kg or 25 kg sugar — Specification (*first revision*)
15279 : 2003	Sugar and sugar products methods of test

3 TERMINOLOGY

3.1 Refined Sugar — Purified and crystallized sucrose (saccharose) with a polarization not less than 99.8 °Z

4 REQUIREMENTS

4.1 Description

Refined sugar shall be crystalline, white, odourless and free from dirt, iron fillings and other extraneous matter.

4.2 The product shall also comply with the requirements given in Table 1.

Table 1 Requirements for Refined Sugar

(*Clause* 4.2)

Sl No.	Characteristics	Requirement	Method of Test, Ref to Cl of IS 15279
(1)	(2)	(3)	(4)
i)	Loss on drying percent by mass, *Max*	0.04	4
ii)	Polarization, °Z*, Min,*	99.8	5
iii)	Reducing sugar, percent by mass, *Max*	0.04	7
iv)	Colour in ICUMSA units, *Max*	60	8
v)	Conductivity ash, percent by mass, *Max*	0.04	9
vi)	Sulphur dioxide, mg/kg, *Max*	10	13
vii)	Lead, mg/kg, *Max*	0.1	15
viii)	Chromium, µg/mg, *Max*	20	16
ix)	Sediment mg/kg Max	7	(Annex – B)
x)	Iron mg/kg Max	5	(Annex – C)
xi)	Floc test	Negative	(Annex – D)

4.3 Refined sugar shall be manufactured, packed, stored and distributed under hygienic conditions (*see* IS 14350).

5 PACKING

5.1 Refined sugar shall be packed in clean, sound and new jute bags (*see* IS 1943) or bags made of polypropylene (*see* IS 10910) or bags made of high density polyethylene (*see* IS 10146). The jute bags may be lined with polyethylene film. The mouth of each bag shall be either machine-stitched or rolled over and hand-stitched. If hand-stitched, the stitches shall be in two rows with at least 14 stitches in each row (*see* IS 14968).

5.1.1 In the case of smaller consumer packs, the product shall be packed in food grade plastics conforming to relevant Indian Standard or any other suitable non-toxic material.

6 MARKING

6.1 Each bag/pack shall bear legibly and indelibly the following particulars:

a) Name of the product;
b) Name and address of the manufacturer;
c) Net weight of sugar;
d) Month and year of manufacture;
e) Batch or Code number;
f) Net quantity;
g) The words 'Best before . . . .' (month and year to be indicated); and
h) Any other information required under the *Legal Metrology (Packaged Commodities) Rules*, 2011 and the *Food Safety and Standards (Packaging and Labelling) Regulations*, 2011.

6.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

7 SAMPLING

Representative samples of refined sugar shall be drawn and the criteria for conformity to this standard shall be established, according to the method prescribed in Annex A. In case of consumer packs, samples of refined sugar shall be drawn and the criteria for conformity to this standard shall be established, according to the method prescribed in Annex A.

ANNEX A

(*Clause* 7)

SAMPLING OF REFINED SUGAR

A-1 GENERAL REQUIREMENTS

In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

A-1.1 The sample shall be taken in a protected place not exposed to damp air, dust or soot.

A-1.2 The sampling instrument shall be clean and dry when used.

A-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

A-1.4 The samples shall be placed in clean, dry and moisture-proof containers.

A-1.5 The sample containers shall be sealed air-tight after filling and marked with full details of sampling, that is, name of the material, the date of sampling, month and year of manufacture, name of the producer, name of the person carrying out the sampling and such other particulars as considered necessary.

A-2 SCALE OF SAMPLING

A-2.1 Lot

All the bags in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the group of bags in each batch shall constitute separate lots.

A-2.1.1 Each lot shall be tested for ascertaining the conformity of refined sugar to the requirement of this standard.

A-2.2 The number of bags to be selected for sampling shall be in accordance with col 2 and 3 of Table 2.

Table 2 Number of Bags to be Selected for Sampling

(*Clause* A-2.2)

Sl No.	No. of Bags in Each Lot *N*	No. of Bags to be Selected *N*
(1)	(2)	(3)
i)	2-25	2
ii)	26-100	3
iii)	101-500	5
iv)	501-1 000	7
v)	1 001 and above	8

A-2.3 These bags shall be selected at random from the lot and in order to ensure the randomness of selection; procedure given in IS 4905 maybe followed.

A-3 TEST SAMPLES AND REFEREE SAMPLE

From the top, middle and bottom portions of each of the selected bags (*see* **A-2**) approximately equal quantity of the sugar shall be taken with the help of a suitable sampling instrument. The sample collected from each of the bags shall be mixed thoroughly to constitute a composite sample of 600 g. The composite sample thus prepared shall be divided approximately into three equal parts; one for the purchaser, one for the supplier and the third for the referee, and sealed air-tight with the particulars as given in **A-1.5**.

A-4 NUMBER OF TESTS

The composite sample prepared as under **A-3** shall be tested for the characteristics as prescribed in Table 1.

A-5 CRITERIA FOR CONFORMITY

The lot shall be declared as conforming to this standard when the test results on various characteristics obtained on the composite sample satisfy the corresponding requirements as specified in 4 and Table 1.

ANNEX B

(*Clause* 4.2, *Table* 1)

DETERMINATION OF INSOLUBLE MATTER (SEDIMENT)

B-1 FIELD OF APPLICATION

The method is applicable to all crystalline white sugars, powdered sugars that do not contain additives and plantation white sugars.

B-2 PRINCIPLE INVOLVED

The sugar to be tested is dissolved in hot water and filtered through a membrane filter of pore size 8.0 µm. The membrane and the retained insoluble matter are thoroughly washed, dried and weighed.

The insoluble matter content is calculated from the increase in mass of the membrane filter.

B-3 REAGENTS AND MATERIALS

Use only analytical grade chemicals and prepare reagents only in distilled water

B-3.1 Chromatographic Spray Reagent — 1, – naphthol/phosphoric acid solution. Dissolve 1.0 g of 1-naphthol in 100 mL of ethanol and add 10 mL of ortho-phosphoric acid (P_{20} 1.69 g/mL).

B-4 APPARATUS

B-4.1 Membrane Filters with Hydrophobic Rim — Diameter about 50 mm, pore size 8.0 µm, for example, Whatman Schleivher and Schuell cellulose nitrate filter AE99, Cat. No.10 405 079.

B-4.2 Filtration Apparatus — Comprising a holder for the membrane filter (*see* **B-5.1**) fitted into a conical filtration flask, of capacity 4L, connected with a vacuum system.

B-4.3 Stainless Steel Jug — Capacity 2 L with a stainless-steel stirring rod.

B-4.4 Tweezers

B-4.5 Plastic Petri Dishes

B-4.6 Drying Oven — Maintained between 60 and 65 °C.

B-4.7 Analytical Balance Readable to 0.1 mg.

B-4.8 Balance — Capacity 5 kg, readable to 1 g.

B-5 PROCEDURE

B-5.1 Preparation of Water

Filter 5 l of water through an 8 µm membrane filter prepared as in **B-5.2**. After the first 500 mL has filtered, turn off the vacuum Swirl this 500 ml around the flask and discard. Continue the filtration of the remaining 4.5 l of water. This water should be used for all requirements in steps **B-5.2** to **B-5.6**. All equipment (jugs, stirring rods, tweezers) should be rinsed in this filtered water before proceeding further.

B-5.2 Preparation of Membrane Filter

Wash the membranes (*see* **B-5.1**) by immersion in boiling distilled water for 6 min, drain the excess water from the membranes and transfer individually to clean, dry petri dishes (*see* **B-4.6**) by using tweezers (*see* **B-4.4).**

Dry the membrane in their dishes with the lids removed for 1 h at 60 °C in the drying oven. After drying, replace the lids and cool for 30 min in a desiccator. Record the mass of the cooled membranes to the nearest 0.1 mg.

B-5.3 Preparation of Sample Solution

Weigh 500 ± 1 g of the sample directly into the stainless steel jug (*see* **B-4.3**). If filtration turns out to be a problem, or sample size is limiting, the sample mass may be reduced to 250 ± 1 g or further if required. Whilst accuracy is lost when the sample size is reduced, this may be unavoidable.

Add hot distilled water at about 45 °C to the jug to give a final volume of about 900 ml. Stir the mixture with the stainless steel rod, or a magnetic stirrer, and heat to about 45 °C; continue stirring until all the sugar has dissolved.

B-5.4 Filtration of the Sugar Solution

Moisten a weighed membrane filter the by floating it on distilled water in the petri dish. Place the moistened filter in the filter holder (*see* **B-4.2**) and pass the hot sugar solution through the membrane filter under reduced pressure. Carefully rinse the jug and stirring rod into the filter holder with hot distilled water. Wash the retained insoluble matter and the membrane in the filter holder using a total volume of hot distilled wash water of about 500 ml.

B-5.5 Drying and Weighing of the Membrane

Return the membrane or its original petri dish. Dry the dish with lid removed in the oven for 1 h at 60 °C to 65 °C. Replace the lid and cool the dish for 30 min in a desiccator. Reweigh the membrane to the nearest 0.1 mg.

The effectiveness of the washing is essential to the accuracy of the test. This may be checked by spraying occasional membrane after use. With the 1-naphthol/phosphoric acid chromatographic spray reagent (*see* **B-4.1**), and heating to 105 °C. The membrane should be entirely free of any trace of violet colouration.

B-6 EXPRESSION OF RESULTS

6.1 Calculation

The insoluble matter content of the sugar expression in milligrams of insoluble matter per kilogram of sample is given by:

$$\text{Insoluble matter (mg/kg)} = (m_2 - m_1/m_0).10^6$$

where

m_1 = mass in grams, of the membrane filter (5.2);

m_2 = mass in grams, of filter + insoluble matter (5.4); and

m_0 = mass in grams, of sample taken for test (5.3).

Expression the result to the nearest mg/kg.

The amount of sample, used for the determination, should always be reported with the results.

6.2 Precision

For while sugars, the absolute difference between two results obtained under repeatability conditions shall be not greater than 4.9 mg/kg. The absolute difference between two results obtained under reproducibility conditions shall be not greater than 7.2 mg/kg.

ANNEX C

(*Clause* 4.2 *Table* 1)

DETERMINATION OF IRON IN REFINED SUGAR PRODUCTS AND SUGAR SOLUTIONS

C-1 FIELD OF APPLICATION

This procedure is applicable to refined sugar products and sugar solutions in general containing between 1 and 40 mg/kg of iron as a contaminant.

C-2 PRINCIPLE

This method is based on the colorimetric reaction between ferrous ions and 1, 10 phenanthroline. Iron is reduced to ferrous ions, Fe by ascorbic acid in a solution at *p*H 1.5. The solution is then raised to 3.5 at which the ferrous ions form a stable red complex with 1, 10 phenanthroline (o-phenanthroline). The colour measured by absorbance at 490 nm is compared with a standard curve to establish the iron content in the sample.

White sugar can be tested directly, but coloured sugar solutions must first be ashed to eliminate the influence of coloured impurities and to dissociate iron from it organic complexes before testing by this method.

C-3 REAGENTS

C-3.1 Ascorbic Acid Solution, approx. 1g/100 mL. Dissolve 1.0 g of analytical reagent grade ascorbic acid in distilled water and make up to 100 mL. keep under refrigeration.

C-3.2 Sodium Acetate Solution, approx. 0.2 mol/L. Dissolve 16.4 g of analytical reagent grade sodium acetate in distilled water and make up to 1 L.

C-3.3 Sodium Acetate Solution, approx. 0.25 g/ 100 mL. Dissolve 164.0 g of analytical reagent grade sodium acetate in distilled water and make up to 1 L.

C-3.4 1, 10-phenanthroline Solution, approx. 0.25 g/100 mL. Dissolve 0.25 g of analytical reagent grade 1, 10-phenanthroline in distilled water and make up to 100 mL.

C-3.5 Sulphuric Acid Concentrated

C-3.6 Standard Iron Solution, 1 000 mg Fe/L. Dissolve 0.865 g of analytical reagent grade ammonium ferric sulphate, $NH_4Fe(SO_4)_2. 12H_2O)$, in 25 mL of distilled water in a 100 mL volumetric flask, add 2.6 mL of concentrated sulphuric acid, cool and make up to the mark with distilled water.

C-3.7 Dilute Standard Iron Solution, 10 mg/ Fe/L. Dilute 1.0 mL of stock standard iron solution (*see* **C-3.6**) to 100 mL with distilled water.

C-3.8 Hydrochloric Acid Concentrated

C-3.9 Hydrochloric Acid, approx. 1.0 mol/L. dilute 93 mL of concentrated hydrochloric acid to 1 L with distilled water.

C-4 APPARATUS

C-4.1 Spectrophotometer or Colorimeter, for use at 490 nm with 1.0 cm cells.

C-4.2 Volumetric Flasks, class A, 50 and 100 mL.

C-4.3 Pipettes, class A, 1, 2 and mL.

C-4.4 Burette, 10 mL, graduated by 0.05 mL.

C-4.5 Waterbath, boiling.

C-4.6 Automatic Titrator of *p*H Meter.

C-4.7 Muffle Furnace and Platinum Dishes

C-5 PROCEDURE

C-5.1 Preparation of the Sample Solution

The sample solution should not contain more than 100 µg of Fe. In the case of white sugars, dissolve 25 g of sample in distilled water in a 100 mL volumetric flask. Add 10 mL of 1 mol/L hydrochloric acid solution (*see* **C-3.9**) P and make up to the mark with distilled water. Mix thoroughly. In the case of sugar solutions, ash 5 g of the production in a platinum dish (without acid) at 600 °C in the muffle furnace for 1-2 h. Dissolve the ash in 2 mL of concentrated hydrochloric acid (*see* **C-3.8**). Add 10 mL of distilled water and hold the mixture in a boiling water bath for 15 min. Transfer the solution quantitatively to a 50 mL volumetric flask and makeup to the mark with distilled water. Mix thoroughly.

C-5.2 Reduction of Ferric Ions to Ferrous Ions

Titrate 25 mL of the sample solution (*see* **C-5.1**) with 2.0 mol/L sodium acetate solution (*see* **C-3.3**) to bring the *p*H to 1.5. add 1.0 mL of ascorbic acid solution (*see* **C-3.1**) and 1.0 mL of 1,10-phenanthroline solution (*see* **C-3.4**) Mix and stand the solution for 5 min.

C-5.3 Colour Development

Titrate the sample solution with 0.2 mol/L sodium acetate solution (*see* **C-3.2**) to bring the *p*H to 3.5. Transfer the sample quantitatively to a 50 mL volumetric flask and make up the volume to the mark with distilled water. Mix and stand the solution for 20 min. Read the absorbance at 490 nm with a reagent blank using a 1 cm cell.

C-5.4 Calibration with Standard Iron Solutions

Pipette 0, 1, 2, 3, 4, 5 and 10 mL aliquots of the dilute standard iron solution (*see* **C-3.7**) corresponding to 1, 10, 20, 30, 40, 50 and 100 µg Fe, respectively, into a series of 50 mL volumetric flasks. To each flask, add 20 mL of distilled water and 1.0 mL of 1 mol/L hydrochloric and solution (*see* **C-3.9**). Titrate with 2.0 mol/L sodium acetate solution (3.3) to bring the *p*H to 1.5 Add 1.0 mL of ascorbic acid solution (*see* **C-3.1**) and 1.0 mL of 1, 10-phenanthroline solution (*see* **C-3.1**) and 1.0 mL of 1,10-phenanthroline solution (*see* **C-3.4**). Mix and stand the mixture for 5 min. Titrate with 0.2 mol/L sodium acetate solution (*see* **C-3.2**) to bring the *p*H to 3.5. Make up the volume to the mark with distilled water. Mix and stand the solutions for 20 min. Read absorbance at 490 nm together with the reagent blank using a 1.0 cm cell. Plot the results on a graph. Use this standard curve to read off the iron content, N, of the test samples.

C-6 EXPRESSION OF RESULTS

C-6.1 Calculation of Results

Divide N by 6.25 to arrive at the concentration (me Fe/kg sugar) of iron in white sugar samples. Divide n by 2.5 to arrive at the concentration (mg Fe/kg product) of iron in sugar solutions.

C-6.2 Precision

For an iron concentration of 50 mg Fe/kg, the coefficient of variation has been reported to be 11-15.[2]

ANNEX D

(*Clause* 4.2 *Table* 1)

ACID BEVERAGE FLOC TEST

D-1 FIELD OF APPLICATION

This method, formerly known as the coca-cola floc test, is applicable to refined sugar products.

D-2 PRINCIPLE

A sugar solution containing approx. 54.5 g sugar/ 100 g is acidified to *p*H 1.5 by adding phosphoric acid and allowed to stand for 10 days at room temperature. Any floc eventually formed is visually examined.

D-3 REAGENTS

Use only analytical grade orthophosphoric acid and only distilled water or water of equivalent purity.

D-3.1 Orthophosphoric Acid, 85 g/100g (P20≈1.7 g/mL).

D-4 APPARATUS

D-4.1 *p*H MeterD.

4.2 Light Source, giving a strong pencil – like beam (for example, a microscope lamp).

D-4.3 Clear Glass Jars, 1L capacity.

D-5 PROCEDURE

Dissolve 600 g of sugar in 500 mL of water and using the *p*H meter. Add phosphoric acid dropwise to *p*H 1.5 (this may take approx. 2.7 mL of phosphoric acid).

Cover the jar containing the acidified solution and set it aside examine it for the appearance of floc after 3.7 and 10 days.

Take care when moving jars for examination. Do not agitate in any way, because any floc formed is very fragile.

Place the jar in front of a strong beam of light (*see* **D-4.2**). preferably in a darkened room. View the solution from the front of the jar, observing that part of the solution lighted by the beam of light. Examine the bottom, middle and top of the solution. (The floc may either rise, be suspended, or precipitate, all three of these conditions may exist in a single sample).

D-6 EXPRESSION OF RESULTS

D-6.1 Result

After the 10th day's observation, attribute a number to the sugar to express its quality. The size of the floc particles and not their quantity determines the ranking, as indicated below:

0 = Negative: Complete absence of visible particulate matter.

0 = Turbid: Cloudy, but contains no visible discrete particles.

1 = Pinpoint: Very small, discrete particles, the shape of which is not discernable, but which are visible in the light beam.

2 = Light: Several particles gathered together to form small, fleecy particles (approx. size 0.8 mm).

3 = Medium: A feathery-like particle (approx. size 1.5 mm).

4 = Heavy: An agglomerate of colloidal particles forming a large fluffy particle, visible without a beam of light (approx. size 3 mm).

A sample with a result of either "0 Negative" or "0 Turbid" can be considered to have PASSED as floc-free.

The other results show that the sample has failed.

ANNEX E

(*Foreword*)

COMMITTEE COMPOSITION

Sugar Industry Sectional Committee, FAD 02

Organization	*Representative(s)*
National Sugar Insititure, Kanpur	Shri Narendra Mohan (***Chairman***) Shri Ashutosh Bajpai (*Alternate*)
Army Service Core (ASC), New Delhi	Lt Col B. B. Sahu
CONCERT, Chennai	Shri R. Santhanam Shri M. Somasundaram (*Alternate*)
Consumer Guidance Society of India, Mumbai	Shri Sitaram Dixit Dr M. S. Kamat (*Alternate*)
Food Corporation of India, New Delhi	Shri Deepak Kumar Panwar Shri Rakesh Kumar Ranjan (*Alternate*)
Food Safety Standards Authority of India, New Delhi	Ms Apoorva Srivastava (*Technical Officer*)
Global Cane Sugar Ltd, New Delhi	Dr G. S. C. Rao Mr Anil Srivastava (*Alternate*)
Indian Institute of Sugarcane Research, Lucknow	Dr A. D. Pathak Dr A. K. Sharma (*Alternate*)
Indian Institute of Toxicology Research, Lucknow	Dr Yogeshwer Shukla
Indian Sugar Mills Association , New Delhi	Shri G. K. Thakur Shri Deep Malik (*Alternate*)
Indian Sugar Exim Corporation, New Delhi	Mr Rajiv Aggarwal Mr Rajeev Kurup (*Alternate*)
MAARC Labs, Pune	Dr Vasudha Keskar
MANAS Industry, Maharashtra	Shri Jeevan Vasant Jadhav
Ministry of Consumer Affairs, Food & Public Distribution, New Delhi	Shri Suresh Chandra
National Co-operative Development Corporation, New Delhi	Shri K. P. Vaish Shri N. K. Sharda (*Alternate*)
National Fed of Co-operative Development Corporation, New Delhi	Mr Manohar Gopal Joshi
The Sugar Technologists Association of India, New Delhi	Shri Sanjay Awasthi Shri Anurag Goyal (*Alternate*)
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VSI, Pune	Dr Rajeev Dani (*Alternate*)
Walchandnagar Industries	Shri D. R. Sardeshmukh Shri P. V. Kawade (*Alternate*)
In personal Capacity	Prof S. K. Gupta
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Member Secretary

Shri Rajpal
Scientist ‘C’ (FAD), BIS

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

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